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## **Farmer field school, farmer life school and farmers club for enriching knowledge and empowering farmers: A case study from Cambodia**

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**Yunita T. Winarto**

*Division of International and Area Studies*

*Pukyong National University*

*Busan, 608-737, Korea*

### **Introduction**

Integrated Pest Management (IPM) program has significantly improved the knowledge as well as agricultural practices among rice farmers in some places in Indonesia, Cambodia and Vietnam. Farmers have not only changed their cultivation strategies, but have also enhanced their abilities to explain the reasons behind adoption of new strategies and to look into a variety of aspects related to their livelihoods. Enhancement of farmers' capacity is reflected from the

new terms IPM farmers have started using to identify themselves, trainers and researchers.

'Farmers call me *kru* (teacher)', explained a farmer trainer in Cambodia to depict her role as perceived by farmers. Teacher or *giao vien* is a term used by farmers to identify farmer trainers in Vietnam. Farmers in Indonesia use the term *petani pemandu* (farmer facilitator) for farmer trainers. However, when farmers refer to those who are diligently carrying out studies on problems of growing crops, they use the terms from the scientific domain: farmer researcher (*petani peneliti*), farmer expert or farmer scientist (*pakar petani*), and even *petani* professor (farmer professor) (Winarto, 1996; Winarto et al., 2000; Pontius et al., 2002). Perception of such new roles among traditional farmers is an outcome of IPM program introduced in Asia during 1990s. IPM assumes that improvement in learning capacity and understanding of farmers will enable them to achieve greater control over conditions they face in their fields (Pontius et al., 2002). Differing from Green Revolution paradigm, IPM concept lays stress on knowledge transmission and improvement through adult education rather than technology transfer *per se*.

As pointed out by Pontius et al. (2002), farmers live and work in a world where they face a variety of contending forces including those related to technology, politics, markets and society. These forces can marginalize farmers if they are not proactive. IPM essentially aims for empowering farmers so that they themselves are able to face different problems and to move from a marginal position to a stronger position in the society. Only by being able to critically analyzing and understanding problems they encounter, by taking action on the basis of their own arguments and decisions, and by evaluating the effectiveness of actions taken, farmers gain confidence in their knowledge and practices. Once they gain confidence in their own strategies, they have the strength and energy to voice and act against what they think is not likely to serve their interests (Winarto et al., 2000; Winarto, 2003). A top-down approach of pushing a technology or policy without transfer of adequate knowledge to farmers is not likely to lead to the goal of sustainable agricultural development. In this paper I have made an effort to analyze the implications of IPM program in Cambodia.

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**Integrated crop management**

In Cambodia, [not the farmers, but] the government perceives the program as an 'integrated crop management', and not an 'integrated pest management' as in Indonesia and the Philippines. Integrated crop management would seem a more appropriate proposition for enhancing farmers' knowledge and improving their practices not only in pest management, but also in the entire crop management strategies.. Majority of farmers in Cambodia are subsistence farmers (Mabbet and Chandler, 1995). Lack of irrigation facilities, inappropriate drainage and poor soil fertility are some common problems faced by farmers in Cambodia. For these reasons, yields are as low as  $1.64 \text{ t ha}^{-1}$  in rainfed rice system and  $3.01 \text{ t ha}^{-1}$  in irrigated dry season rice system. Mabbet and Chandler (1995) reported that farmers in Battambang were able to achieve yields as high as  $2\text{-}3 \text{ t ha}^{-1}$  during 1960s. Following the collapse of Democratic Kampuchea, average yields dropped to a level of  $1 \text{ t ha}^{-1}$ , one of the lowest in South-east Asia. There has been some improvement in rice production in recent years. Aggregate rice production in the country has been stable during the last five years with a small surplus at the national level.

Low rice productivity seems to be largely due to poor agroecosystem management. Farmers lack knowledge and skills related to agricultural ecology. Chemical fertilizers are used but amount and method of application are inappropriate (Ngin Chhay, 2002). Farmers grow traditional varieties with a long maturity period during wet season (May-December) and high yielding varieties during dry season (December-April). Modern inputs such as chemical fertilizers and pesticides are applied in high yielding varieties, more so in region bordering Vietnam where pesticides are often dumped.

Promotion of high yielding varieties of rice, improvement in soil fertility and development of irrigation system are the essential elements of crop intensification program conceived by the Royal Government of Cambodia (Ngin Chhay, 2002). Agricultural intensification is likely to be accelerated with the opening of market to international products, as observed in Indonesia and the Philippines. Such changes increase the risks like outbreaks of pests and diseases, loss of traditional rice varieties and deterioration of agroecosystems.

The Integrated Pest Management (IPM) programme was viewed by the Royal Government of Cambodia as a means to ensure food security on a sustainable basis and IPM approach of Farmer Field School (FFS) as an appropriate way to enhance farmers' technical/managerial capacity to deal with problems related to pests as well as other factors reducing yields. The program was named as 'integrated crop (and not pest) management' because it aimed for management of not merely pests but of the entire crop system. The program is based on a premise that, with improvement in technical knowledge and managerial capacity, farmers would adopt crop intensification pathways contributing towards long term sustainability of agroecosystems. In line with these objectives, the question is how could the Farmer Field School educate farmers in a participatory way on the one hand, and transfers technological information and practices on the other hand?

#### **Farmer Field School: Adult learning process for technology transfer**

Farmer Field School is the most distinguished feature of IPM program. Taking detailed observations in field, analysis of observations and presentation of results/conclusions are the activities performed by farmer participants (25-30 farmers) in such a school. Agricultural officials and farmer trainers facilitate farmers to carry out these activities held once a week throughout the whole crop season (Pontius et al., 2000; Gallagher, 2003; Ngim Chhay, 2002). The way farmers are trained in Farmer Field School is thus radically different from the way a teacher teaches students in a formal school or extension workers transfer technology. This standard model of the school with its emphasis on learner-centred and experiential learning initially tried for rice system is now being adopted for improvement in production of a range of food crops (Pontius et al., 2000; van de Pool, 2003), livestock (Minjauw et al., 2003), tree crops (Mangan and Mangan, 2003) and forest resources (Singh, 2003). Such a wide range of adoption is an indicator of adaptability/flexibility of Farmer Field School approach in diverse ecological and socio-economic settings. Variations and adaptations to local needs and conditions are one feature of the 'school' despite the participatory discovery learning approach. These standard models should be maintained within

different settings and contexts (Pontius et al., 2000).

#### Box 1. Farmers reaction to Farmers Field School

- Earlier, we did not know what ‘smooth land’ is and when we have to apply fertilizer. Now we know what water level should be kept in the field. We used to apply fertilizer even though the water level was high up to 20 cm in the field. Now we know and leave only 5 cm high water level in the field.
- The yield increased and we also used less amount of seed than before. Earlier, we used 6-7 *taos* seeds  $\text{ha}^{-1}$  (1 *taos* = 15 kg). Now we use only half of this rate.
- When I followed Integrated Pest Management (IPM) practice, I could increase yield from 2 t to over 3 t  $\text{ha}^{-1}$ .
- Earlier we used to burn straw. Now we incorporate it in the soil within crop fields.

In Cambodian context, the IPM planners implemented such a standard model by allowing farmers to observe, discover, analyse, and decide the steps they have to do in managing their fields. On the other hand, by using the comparative plots: the IPM and non-IPM treated plots, the facilitators introduced new practices in the IPM treated plot, while instructing farmers to practice their conventional ways of cultivation in the non-IPM treated plot. Thus, farmers have the opportunity to compare performance of crops in plots managed based on traditional techniques and plots managed on improved techniques practiced by farmers during the learning process. These activities are complemented by special topics provided in regular sessions that could also be used to introduce new knowledge and practices. Some key understandings learned in relation to the agro-ecosystem analysis are the function of natural enemies, prey-predator dynamics, and the negative impacts of pesticides on environment and health. Thus, within the adult learning process, farmers learned how to improve traditional ways in selecting varieties, preparing land, transplanting, weeding, and controlling pest/disease (Box 1; van Duuren et al., 2002; van Duuren, 2003).

**Farmer Life School: From agroecosystem to human ecosystem analysis**

Farmer Life School is a case of how the standard model of Farmer Field School can be capitalized upon to deal with off-farm problems like health issues. Singh (2002) remarked that the farmer field schools and ensuing community IPM strategies have now come of age and express themselves by ramifications into new, sometimes unexpected directions, like the recent emergence in Cambodia of Farmer Life Schools, which focus on mobilizing and empowering rural communities in their struggle against HIV/AIDS. Farmer Life School idea originated from South-east Asian HIV program of United Nations Development Program (UNDP). The UNDP in collaboration with the Food and Agriculture Organization (FAO) agreed to develop a pilot program based on Farmer Field School approach and IPM strategies (Polo Yech, 2003). Thus, approaches for enhancing small scale livelihood in marginal rural areas should look beyond agricultural problems. Farmers are used to interpret and explain phenomena surrounding their daily life through analogy. My studies in Java and Central Lampung, Indonesia, reveal that farmers interpret the conditions of crop growth in terms of stages similar to the growth of human body. In the same way, they considered pesticide use analogous to medicines used to cure human diseases (Winarto, 1996, 1998, 2003). This is also the case when FIELD Indonesia, a non-government organization, facilitated some IPM farmers in Java to organize to resolve their off-farm problems. Farmers addressed off-farm problems following the conceptual framework adopted for addressing on-farm problems. Such an analogy also became the basis of developing the design of Farmer Life School in Cambodia. Widening of scope of crop ecology to human ecology, of integrated pest management to integrated crop/livelihood management, and of agroecosystem analysis (AESAs) to human ecosystem analysis (HESAs) are the movements underlying Farmer Life School framework. Using this framework enables farmers to understand how their behavior affect their livelihoods, much like ecology helps to understand how physico-chemical environment influence organisms. As farmers analyze crop growth related problems as a part of agroecosystem analysis, they analyze livelihood problems faced by different individuals and families as a part of human ecosystem

analysis (See Plate 1). In Farmer Life School, farmers undergoing training analyze livelihood problems, and present the results to the concerned families (Polo Yech, 2003). In situations where farmers have very limited access to information and facilities, organizing and facilitating farmers to think, discuss and to capitalize upon indigenous resources to solve their problems seems to be an appropriate strategy for developing sustainable livelihood systems.

### **Farmers Club: Enhancing creativity and empowering farmers**

Changing or enriching farmers' knowledge is the most beneficial result of Farmer Field School. A school nevertheless aims to train a particular number of farmers. Usually 25-30 farmers are trained in a season in a school. In Cambodia, only one Farmer Field School has been established in a village. As a result, only a few farmers of a village get training opportunities. Trained individuals are expected to disseminate knowledge gained by them in Farmers School to other farmers together with their adoption of IPM practices. However, disseminating new ideas and schemas is not as easy as transmitting observable actions. A comprehensive knowledge of IPM cannot be thoroughly transmitted through daily narrative conversation. Lessons-learned from Indonesia reveal that non-IPM farmers are likely to pay a more serious attention to IPM when the IPM farmers practiced their new learning during severe and widespread pest outbreaks, e.g., damage caused by white rice stem borer during early/mid 1990s (Winarto, 1996), rather than in the absence of pest/disease hazards. At the same time, various modern agricultural inputs are persistently being introduced to the farmers. Farmer School program can thus make a very visible impact if IPM farmers form an organization for setting up a larger number of schools to allow a larger number of farmers attending the 'school' (Winarto et al., 2000). Van Duuren (2003) also reports that the dissemination of IPM knowledge in Cambodia is limited. I have observed that non-IPM farmers learn from IPM farmers that they need to change their ways of application of fertilizers and some notions of natural enemies, but without a comprehensive understanding of what IPM meant. Pontius et al. (2002) argue that IPM farmer field schools are not an end in themselves; they are a starting point for development of a sustainable agricultural system in a given locality. Farmer Field Schools set in

motion a longer term process, in which opportunities are created for local leadership to emerge and for new locally devised strategies to be tested. This longer-term process has been identified as community IPM. Community IPM is a strategic approach whose goal is to institutionalize IPM at community level (Pontius et al., 2002). Community IPM begins with education at the Farmer Field School. The next step is the follow-up of the school with additional opportunities for farmers to build their skills. These activities enable farmers to improve their knowledge through research. The goal of post-Farmer Field School activities is to enhance the capacities of farmers to manage their shared resources. Community IPM seeks to institutionalize IPM at the local level by putting farmers in control of the process of planning and implementing their own IPM programs through IPM Clubs.

For reaching out to the wider community, Cambodia National IPM program promoted regular meetings of IPM alumni, on-farm experimentation conducted by farmers (farmers science), visits of provincial government IPM facilitators to villages, refresher training courses addressing location specific needs and exchange of information between different farmer groups (Ngin Chhay, 2002). Not all of the IPM participants, however, decided to join the clubs. Those who joined the club elected their leaders and defined club activities. In early stages, IPM farmers usually appoint farmer trainers to lead the clubs. Not all of the clubs, however, decided to run field experiments. One club, for example, chose to have a saving activity. As observed elsewhere in Indonesia, in some clubs, IPM farmers in Cambodia started systematic experimentation with repetition and comparison in their efforts of improving their conventional ways of trial-and-error experiences. Farmer clubs could thus lead to the enhancement of farmers' creativity and empowerment. However, further study is required to know if farmers themselves creatively design new experiments or merely repeat the lessons learned, either in Farmer Field School or in the refresher course for farmer trainers.

### **Conclusions**

The IPM program indeed provides immense scope for improving farmers knowledge and capacity. Knowledge and empowerment are key subjects in designing an alternative approach



for enhancing small-scale livelihood together with ecologically sound natural resource management. If technology becomes the core of the approach, I strongly argue that transfer of technology should be accompanied by the transmission of the new model or schema of interpretation. There does exist an immense scope of improving farmers' indigenous practices. The IPM case reveals that once farmers are able to adopt and form new schemas of interpretation and know how to benefit from their own experiences, they improve their capacity to deal with not only agriculture related problems but also problems in other domains. Indeed, transmission of knowledge is not as easy as transfer of technology. Institutionalizing the new knowledge to be part of the existing cultural (shared) knowledge strengthened by cultural norms and values may foster its quick and wider dissemination.

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